

APPLICATION FOR UNITED STATES LETTERS PATENT

FOR

MOBILE COMPUTING SYSTEM HAVING A MODEM AND METHOD THEREFOR

Sub
Bl

Inventor(s): Michael S. Chartier

Prepared by: Kenneth M. Seddon,
Patent Attorney

intel®

Intel Corporation
5000 W. Chandler Blvd., CH6-404
Chandler, AZ 85226-3699
Phone: (480) 554-9732
Facsimile: (480) 554-7738

"Express Mail" label number EL034440103US

EL034440103US

MOBILE COMPUTING SYSTEM HAVING A MODEM AND METHOD THEREFOR

BACKGROUND

10 The use of batteries to power portable computing devices (e.g., laptop computers,
5 palmtop computers, personal digital assistants (PDA's), etc.) typically offer users the
flexibility of operating the devices where ever the user desires. However, the current
state of battery technology is not capable of providing an indefinite supply of power to
the devices. This is due, at least in part, to the amount of power that may be consumed
by some of the components of a portable computing device. Components such as the
15 display, processor, and hard disk drive are typically responsible for a large portion of the
power used by mobile devices.

Consequently, many portable computing devices have a stand-by or idle mode that
attempts to reduce the amount of power that is consumed when the device is not actively
being used by the user. However, these low-power modes attempt to deactivate many, if
not all, of the components in the portable computing device. For example, the PC98
20 Design Guide proposed by Intel Corporation and Microsoft Corporation calls for power to
be removed from the main processor when the computing device is turned off. In
addition, when power to the main processor is removed, power is also removed from any
of the components in a portable computing device that share the same power source.

Consequently, the other components of the portable computing device may not be
used. This generally prohibits any wireless or wired communication with other
components or a network when the main processor is disabled. Thus, there is a
continuing need for better ways to improve the operation of portable communication

EL034440103US

devices.

BRIEF DESCRIPTION OF THE DRAWING

The subject matter regarded as the invention is particularly pointed out and
5 distinctly claimed in the concluding portion of the specification. The invention, however,
both as to organization and method of operation, together with objects, features, and
advantages thereof, may best be understood by reference to the following detailed
description when read with the accompanying drawing in which:

the sole figure is a block diagram representation of an embodiment of a system
10 having a modem in accordance with the present invention.

DETAILED DESCRIPTION

In the following detailed description, numerous specific details are set forth in order
to provide a thorough understanding of the invention. However, it will be understood by
15 those skilled in the art that the present invention may be practiced without these specific
details. In other instances, well-known methods, procedures, components and circuits
have not been described in detail so as not to obscure the present invention.

An algorithm or program is here, and generally, considered to be a self-consistent
sequence of acts or operations leading to a desired result. These include physical
20 manipulations of physical quantities. Usually, though not necessarily, these quantities
take the form of electrical or magnetic signals capable of being stored, transferred,
combined, compared, and otherwise manipulated. It has proven convenient at times,

EL034440103US

principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers or the like. It should be understood, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities.

5 Unless specifically stated otherwise, as apparent from the following discussions, it is appreciated that throughout the specification discussions utilizing terms such as "processing," "computing," "calculating," "determining," or the like, refer to the action and/or processes of a computer or computing system, or similar electronic computing device, that manipulate and/or transform data represented as physical, such as electronic,
10 quantities within the computing system's registers and/or memories into other data similarly represented as physical quantities within the computing system's memories, registers or other such information storage, transmission or display devices.

Embodiments of the present invention may include apparatuses for performing the operations herein. This apparatus may be specially constructed for the desired purposes, or it may comprise a general purpose computing device selectively activated or reconfigured by a program stored in the device. Such a program may be stored on a storage medium, such as, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, magnetic-optical disks, read-only memories (ROMs), random access memories (RAMs), electrically programmable read-only memories (EPROMs),
15 electrically erasable and programmable read only memories (EEPROMs), magnetic or
20 optical cards, or any other type of media suitable for storing electronic instructions, and capable of being coupled to a system bus for a computing device.

The processes and displays presented herein are not inherently related to any
EL034440103US

particular computing device or other apparatus. Various general purpose systems may be used with programs in accordance with the teachings herein, or it may prove convenient to construct a more specialized apparatus to perform the desired method. The desired structure for a variety of these systems will appear from the description below. In addition, embodiments of the present invention are not described with reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings of the invention as described herein. In the following description and claims, the terms "coupled" and "connected," along with their derivatives, may be used. It should be understood that these terms are not intended as synonyms for each other. Rather, in particular embodiments, "connected" may be used to indicate that two or more elements are in direct physical or electrical contact with each other. "Coupled" may also mean that two or more elements are in direct physical or electrical contact. However, "coupled" may also mean that two or more elements are not in direct contact with each other, but yet still co-operate or interact with each other.

Turning to the figure, an embodiment 100 in accordance with the present invention is described. Embodiment 100 may comprise a portable computing device 10 that may comprise, for example, a laptop computer, a palmtop computer, a PDA, or the like. However, it should be understood that only a portion of portable computing device 10 is included in the figure and that the scope of the present invention is not limited to these examples.

Portable computing device 10 may comprise a main processor 50, such as a Pentium III processor™ from Intel Corporation, Santa Clara, California, that may be used to execute programs for a user. For example, main processor 50 may execute application programs as desired by the user or execute operating software used to control the

EL034440103US

components within or external to portable computing device 10. Portable computing device 10 may optionally comprise a display 20 to provide the user with requested information. It should also be understood that portable communication device 10 may comprise other components such as a disk drive, Input/Output (IO) devices, and the like, although the scope of the present invention is not limited in this respect.

Portable computing device 10 may also comprise a modem 70 that may be used to receive or transmit data while main processor 50 is deactivated. As explained in more detail below, modem 70 may be programmed to download or transmit information when main processor 50 is in an idle mode or is turned off altogether. For example, a user may program modem 70 to download data, such as email, stock data, news articles, etc, while portable computing device is otherwise inactive. Thus, modem 70 may be used to retrieve communications from a network while main processor 50 is inactive or even powered off.

In this particular embodiment, modem 70 uses a wireless system to receive and transmit communication from a network, although the scope of the present invention is not limited in this respect. In alternative embodiments, modem 70 may use a wired connection, such as a phone line, network cable, etc., to receive or transmit communications with a network.

In a wireless embodiment, modem 70 may comprise an antennae 76 and a receive/transmitter unit 72 to broadcast and receive radio frequency (RF) communications. It should be understood, however, that the scope of the present invention is not limited by the particular frequency used to communicate portable computing device 10. Modem 70 may also optionally comprise an A/D, D/A converter 73 and a digital signal processor

EL034440103US

(DSP) 74 that may be used to process base band or intermediate frequency (IF) signals.

Modem 70 may also comprise other components, such as filters, decoders, multipliers, etc., (not shown) that may be used to process a received communication or to transmit a communication.

5 Modem 79 may also comprise a modem processor 71 that may be programmed to store messages in memory 75. Although the scope of the present invention is not limited in this respect, memory 75 may comprise non-volatile memory, such as flash memory, EEPROM's, etc., and/or volatile memory such as SRAM. Among other things, memory 75 may be used to store the instructions to be executed by modem processor 71 when main processor 50 is inactive. Memory 75 may also comprises a variety of different types of memory that have different power consumption characteristics. For example, memory 75 may comprise flash memory and static random access memory (SRAM). In some embodiments, the SRAM memory may be used as temporary storage until it is appropriate to transfer the data from the SRAM memory to the flash memory.

10
15
20 Memory 75 may also be used to store user profile information, such as user account information to be used to connect to a network. In addition, memory 75 may be used to store data indicating what information is to be retrieved or transmitted by modem 75 and stored in memory 75. For example, memory 75 may programmed by a user to identify which emails are to be downloaded or transmitted, what data is to be downloaded from the network (e.g., the names of files), or what data is to be downloaded from the internet (e.g., stock data), although the scope of the present invention is not limited in this respect.

In accordance with a particular embodiment of the present invention, a user may

EL034440103US

program modem 70 with the user profile data using main processor 50. Alternatively, the user profile data may be downloaded from a network using modem 70. When portable computing device 10 is not actively being used by a user (e.g., main processor 50 is inactive or powered off), modem processor 70 may execute instructions so that modem 70 establishes communication with a network. Thus, modem processor 71 may operate independently from main processor 50. For example, modem 70 may be used to connect to a network when portable computing device 10 is recharging or otherwise inactive. In particular embodiments, this may be desirable to reduce the amount of power that is consumed by portable computing device 10. Alternatively, in some embodiments it may be desirable to completely remove all power to main processor 50 so that main processor 50 consumes substantially no current or power.

Once a connection has been established, modem processor 71 may download communications and store them in memory 75. Modem processor 71 may also generate the appropriate control signals so that modem 70 transmits messages from memory 75. Thus, modem 70 may be used to share data with a network even though the main processor (e.g., main processor 50) of portable computing device is inactive. Although the scope of the present invention is not limited in this respect, modem 70 may be used to receive or transmit communications when power is removed from main processor 50. Alternatively, the user may program modem 70 to identify when modem 70 is to receive or transmit data. This may be desirable so that the user may connect to a network during periods of reduced traffic or networking costs.

After data has been stored in memory 75, the user may activate portable computing device 10 and use main processor 50 to access the data (e.g., communications) that were

EL034440103US

5 While certain features of the invention have been illustrated and described herein, many modifications, substitutions, changes, and equivalents will now occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	---